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(71) Applicant *(for all designated States except US)*: NUVERA FUEL CELLS, INC. [US/US]; 20 Acorn Park, Cambridge, MA 02140 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: LEN, Gregory, D. [US/US]; 152 Pleasant Street, Apt. 1, Arlington, MA 02474 (US). MUELLER, Fortunat, J. [CH/US]; 289 Medford Street, Apt. #1, Somerville, MA 02143 (US). RIZZO, Vincent [US/US]; 8 Bay State Avenue, Apt. 3, Somerville, MA 02144 (US).

(74) Agents: SMITH, James, M. et al.; Hamilton, Brook, Smith & Reynolds, P.C., 530 Virginia Road, P.O. Box 9133, Concord, MA 01742-9133 (US).

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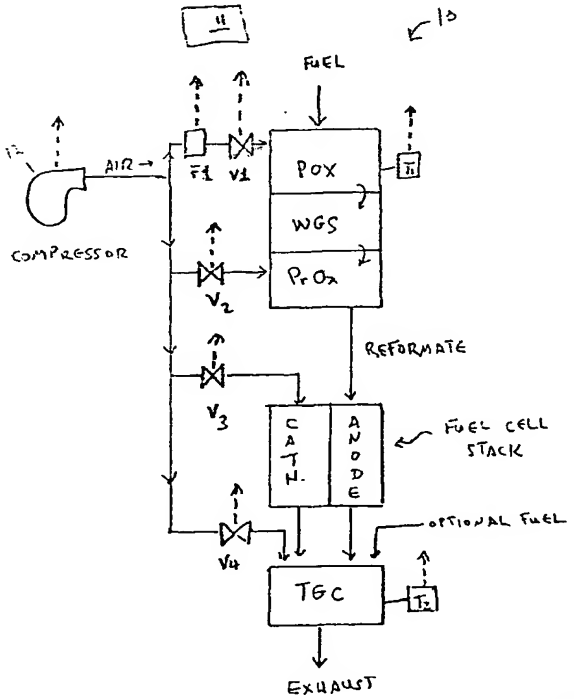
(54) Title: METHOD AND SYSTEM FOR CONTROLLING FLUID FLOW IN A FUEL PROCESSING SYSTEM



(57) Abstract: Fuel processing systems, which reform a hydrocarbon fuel to produce hydrogen suitable for use in a fuel cell, have multiple air inlets for various process steps. Controls and feedback loops are correspondingly complex. Controlling the multiple airflows to a pressurized fuel processor using a single onboard compressor and a number of low pressure drop valves is a significant challenge to overcome in the process of getting a reformer on board a vehicle. A method has been developed for controlling the compressor speed based on the airflow demand of the partial oxidation (POX) zone, without direct feedback from the other airflows in the system. This ensures that the principal zone of air consumption always gets the appropriate amount of air, thus controlling the temperature of that zone and the reaction chemistry effectively. This method also allows removal of extra flow sensors from airflows where the effect of changed airflow (e.g. temperature change) can be used as a feedback to an air controller instead of the actual airflow itself. Similar principles are applicable in the control of other flows, such as fuel and water, when several flows are fed by a common source.